NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

MILKHOUSE WASTEWATER INFILTRATION AREA

New York

(each)
code NY719

DEFINITION

A component of a waste management system that will remove pollutants from milking center wastewater through a variety of processes.

PURPOSE

To improve water quality by reducing the environmental impact of milking center wastewater. This is accomplished through the processes of settlement, filtration, infiltration, absorption, adsorption, evaporation, biological reduction and volatilization.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies when it is a component of a waste management system and where:

- Wastewater is generated from the washing of tanks, pipelines, milking machines, and associated equipment. It may include wash water from animal preparation and parlor floors. It shall not be used to treat dumped milk or sewage from rest rooms.
- Manure from the animal housing system is handled as a solid or semi-solid.
- Reducing the amount of liquid in a manure storage system is a priority.

CRITERIA

General

The milkhouse wastewater infiltration area and appurtenances shall be planned, designed, and constructed to meet all federal, state, and local laws and regulations, including cultural resources, in compliance with General Manual 420, Part 401.

Components shall be suitable for the site conditions. These conditions include vehicular traffic and soil loads, corrosion of materials, flotation of tanks, and frost action.

Odor Trap

An odor trap, such as a plumber's "P-trap", shall be installed in the distribution pipeline before the air vent, between the milking center and settling trap, to prevent odors from entering buildings. See figure 1.

Air Vent

A combination vent and surge protection outlet shall be located before the distribution box. See figure 1.

Pipeline

For gravity systems, the pipeline shall have a minimum inside diameter of 4 inches and be in accordance with the conservation practice standard Manure Transfer (NY634). Pipe for pump systems shall meet the pump manufacturer's specifications for size and pressure rating. Provide access to the pipeline at appropriate intervals for cleanout. Pipe shall be located at an adequate depth or otherwise protected to avoid damage from vehicles and frost.

Solids Traps

A grease trap shall be used to remove milk fats and other floatable solids on all

systems. Parlor milking systems shall additionally incorporate a solids settling trap.

The capacity of the traps shall be a minimum of three times the actual daily flow. Traps shall be water tight, designed not to float and be accessible year-round for periodic cleanout. Cleanout ports shall have risers and covers for accessibility and safety.

Pump

A pump shall be used if gravity flow is not possible. The pump station shall have a riser and cover for year-round access and safety.

Safety

Ventilation and warning signs must be provided for solids traps and covered storages to warn of potential explosion, poisoning or asphyxiation.

Effluent Distribution

A distribution system shall be used to distribute the effluent through perforated (5/8 inch minimum diameter perforations) header pipes across the uphill side of the infiltration area. Center the header pipe on a 12-inch thick layer of crushed stone at the inlet end of the bed. Extend the stone layer along the entire length of the header pipe. Use a minimum stone layer width of 2 feet, perpendicular to the header pipe.

Infiltration Area

A site investigation is required to locate the organic matter area. Infiltration area shall not be located where it can contaminate water supply aquifers or wells. The area should be located as far as practical from water sources, property lines and other resources of concern. See Table 1 for minimum setback distances for the infiltration area. Exclude all surface and subsurface water from the infiltration area.

The infiltration bed area shall be loosened after final grading with a chisel plow or harrow to remove the major compaction of the bed infiltration area caused during construction.

Table 1
Minimum Setback Distances (in feet) From Any Edge of the Infiltration Area

Site Features	Setback Distance (ft.) From Infiltration Area
Wells with water usage of 2000 or more GPD	300
Owner's or Neighbor's wells	100
Water supply lines	10
Water course, major (Blue line on topo map)	100
Water course minor	50
Drainage ditches	25
DEC jurisdictional wetland (uphill wetland edge to toe of Organic Matter Bed)	100
Slopes greater than 3:1	10
No basement below grade (slab, frost wall, posts)	15
Full basement below grade	20
Property lines	25
Burial sites or graveyards	25

The infiltration area shall be located in soils with moderate to rapidly moderate permeability and adequate depth to bedrock and the water table. A soils investigation, with at least two test pits describing a representative soil profile, and at least one in place permeability test shall be conducted to size and locate the bed. On sites where the soils are modified, documentation shall be provided to verify in place permeability. The infiltration area shall be located in a soil profile that falls within the requirements listed in Table 2.

Table 2
Soil Requirements for Infiltration Area

Property	Requirement	Comments
Permeability of C Horizon (Inches/Hour)	0.2 to 6 inches per hour	-
Depth To Bedrock (Inches)	≥ 40 inches	Soils with <40 inches to bedrock may be used if soil is modified. Modify the soil by raising the area with loam liner material to obtain minimum separation distance of 40 inches to bedrock.
Depth To High Water Table (Feet)	≥ 1.5 feet	Soils with <18 inches to these layers may be used if soil is modified. Modify the soil by raising the area with loam liner material to obtain minimum separation distance of 24 inches to seasonal high water table or hydraulically restrictive layer.
Flooding	≤ once in 25 years	

Sizing of the structure is based upon soil permeability and the rate of wastewater flow. The design flow is the actual flow in gallons per day (gpd) from all sources of wastewater

Table 3
Hydraulic Loading Rates

Percolation Rate inches/hour	Hydraulic Loading Rate (sq. ft. x days/gal.)
6.0	7.8
4.0	8.7
3.0	10.0
2.0	11.7
1.5	14.0
1.0	15.5
0.5	23.3
0.2	46.7

Infiltration area shall be constructed with a level bottom and to provide a minimum of 12 inches of containment at the lower edge. See figure 1.

Organic material shall be backfilled over the infiltration area. Organic material for the area shall be any clean carbonaceous material of a somewhat durable nature, such as wood chips, bark, or shavings.

Minimum thickness of organic material over the header pipe is 36 inches. See figure 1.

Fence

Install fence around the infiltration area as necessary to exclude equipment, animals, and people. Fence shall be in accordance with conservation practice standard 382.

Erosion and Sediment Control

An erosion and sediment control plan shall be developed for all disturbed areas. For disturbed areas greater than one acre, the erosion and sediment control plan shall meet the planning, installation, and maintenance requirements of NYS Pollutant Discharge Elimination System General Permit for Storm water Discharges. All Erosion and sediment structures and measures shall be installed prior to earth disturbing activities unless otherwise directed in the construction drawings.

CONSIDERATIONS

The following shall be considered during design:

- On-farm traffic patterns.
- Accessibility to the milkhouse wastewater infiltration area components.
- Adjacent land uses and visibility.

- Location and height of air vents to avoid the odors that may be prevalent in the pipeline.
- Visual aesthetics to blend the system into the surrounding landscape.
- Site, soil, and environmental factors.
- Availability of organic matter.
- To eliminate the potential of a leaking dike, obtain the required 12 inch minimum containment by constructing bed area in ground.
- Install submersible pump in grease trap for agitation and pumping fat cake to manure spreader.
- Install inline supplemental filter to trap additional fats and solids before reaching filter bed.
- To reduce maintenance and need to clean grease trap as frequently, exclude first rinse of wastewater from the infiltration area by feeding liquid to animals or by handling it with the manure.
- To minimize maintenance, limit this practice to dairies of less than 120 milkers for parlor operations.
- Install an alarm for the pump to alert operator of failure.

PLANS AND SPECIFICATIONS

Plans and specifications for installing milkhouse wastewater infiltration area shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed that is consistent with the purposes of this practice, it's intended life, and the criteria for its design. The operation and maintenance plan shall address the following items:

- Safety procedures required for operation and maintenance of the facility
- Periodic monitoring and cleanout of the solids traps and any inline supplemental filters. Proper disposal shall be in a manure storage structure, land application, or by other acceptable means.
- Periodic replenishment or replacement of organic matter in the infiltration area. Proper disposal of the used matter shall be in a manure storage structure, land application, composting, or by other acceptable means.
- Maintain adequate vegetative cover on adjacent areas.
- Repair of damage to any earthfills, fences, pipes, and other appurtenances.
- Maintain lids and openings to underground structures to ensure year-round access.
- Maintain grates on drains and subsurface drainage systems to ensure they are functional and that rodent guards are in place.
- Ensure that waste milk is not dumped into the milkhouse wastewater infiltration area.

Erosion and sediment control structures will be maintained periodically and after every major runoff event until the disturbed area is fully protected.

REFERENCES

1. **Agricultural Waste Management Field Handbook**, 651.1004, USDA-NRCS
2. **NYS Health Dept. Standards for Waste Treatment for Household Systems**
3. **Dairy Manure Management,** Proceedings from the Dairy Manure Management Symposium, 1989, NRAES-31, www.nraes.org
4. **Treatment Methods for Milking Center Wastewater**, Wright, Peter E., Designing a Modern Milking Center: Parlors, Milking Systems, Management, and Economics. Northeast Regional Agricultural Engineering Service, NRAES-73, 1995.
5. **New York Standards and Specifications for Erosion and Sediment Control** (blue book)